A STUDY OF SOFT TISSUE SARCOMA

Dissertation submitted in partial fulfillment of regulation for the award of M.S. Degree in General Surgery

(Branch I)

THE TAMILNADU

DR. M.G.R. MEDICAL UNIVERSITY

Chennai

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CERTIFICATE

Certified that this is the bonafide dissertation done by Dr.* P. SUMITHRA *and submitted in partial fulfillment of the requirements for the Degree of M.S., General Surgery, Branch I of The Tamilnadu Dr. M.G.R. Medical University, Chennai.

Date : ***Unit Chief***

Date : ***Professor & Head***
Department of Surgery

Date : ***Dean***
Coimbatore Medical College
Coimbatore - 641 014

DECLARATION

I solemnly declare that the dissertation titled **"A STUDY OF SOFT TISSUE SARCOMA"** was done by me from 2007 onwards under the guidance and supervision of **Associate Professor Dr. R. KATTABOMMAN & Professor Dr. N. JAYARAMACHANDRAN (Retd).**

This dissertation is submitted to the **Tamilnadu Dr. MGR Medical University** towards the partial fulfillment of the requirement for the award of MS Degree in General Surgery (Branch I).

Place : **Dr. P. SUMITHRA**

Date :

Coimbatore Medical College

COIMBATORE, TAMILNADU, INDIA - 641 014

(Affiliated to The T.N. Dr. MGR Medical University, Chennai)

ETHICS COMMITTEE

CERTIFICATE

Name of the Candidate : Dr. P. Sumithra

Course : M.S. General Surgery

Period of Study : 2007 - 2010

College : Coimbatore Medical College

Dissertation Topic : A Study of Soft Tissue Sarcomas

The Ethics Committee, Coimbatore Medical College has decided to inform that your Dissertation is accepted / ~~Not accepted~~ and you are permitted / ~~Not Permitted~~ to proceed with the above Study.

Coimbatore - 14.

Date : 13.02.08

N. Kulandaivel

Secretary
Ethics Committee

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Place : Coimbatore ***Dr. P. SUMITHRA***

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INTRODUCTION

A Study of Soft Tissue Sarcoma

Introduction

Soft tissue sarcomas comprise a group of relatively rare, anatomically and histologically diverse neoplasms that share a common embryologic origin arising primarily from tissues derived from the mesoderm with the notable exception of neurosarcomas, primitive neuro ectodermal tumors (PNET) and possible Ewing's sarcoma, which are thought to arise from tissues of ectodermal origin.

AIM OF THE STUDY

Aim of the Study

1. To find out the incidence of soft tissue sarcoma in Coimbatore Medical College Hospital.

2. To evaluate the etiopathogenesis of soft tissue sarcomas.

3. To evaluate the diagnostic modalities availed.

4. To evaluate the outcome of surgery for soft tissue sarcomas.

5. To evaluate the role of radiotherapy and chemotherapy in soft tissue sarcomas.

6. To evaluate the results following combined modality treatment of soft tissue sarcomas.

7. To evaluate the incidence of recurrence and the causes for the recurrence.

REVIEW OF LITERATURE

Review of Literature

Incidence

Soft tissue sarcoma accounts for < 1% of adult malignancies and 15% of pediatric malignancies.

Etiology

No specific etiologic agent is identified in the overwhelming majority of patient with soft tissue sarcoma. Risk factors of STS include the following:

1. Previous radiation exposure

The risk of post radiotherapy sarcomas increases with increasing dosage. By definition, radiotherapy induced sarcomas arise no sooner than 3 yrs after therapeutic radiation and often arise decades later. Sarcomas occurring after radiation exposure are most commonly malignant fibrous histiocytoma.

2. Environmental Factors

Chemical exposure to phenoxy acetic acid, found in herbicides, chlorophenol, found in wood preservatives are associated with STS. Thorotrast, vinyl chloride, arsenic are associated with hepatic angio sarcoma.

3. Chronic Lymphedema

Chronic Lymphedema such as that experience after axillary dissection has been associated with Lymphangio sarcoma (stewart – Treves syndrome)

4. Chronic Inflammatory process may a risk factor

Agents such as shrapnel, bullets, intra muscular iron injections and foreign body implants have been implicated.

5. Genetic predisposition

Specific inherited genetic alterations have been associated with an increased risk of STS. Patients with Gardner's syndrome (Familial polyposis) have a higher than normal incidence of desmoids.

Patients with germline mutations in the tumor suppressor gene p53 (Li- Fraumeni syndrome) have high incidence of sarcomas.

Patients with von Recklinghausen's disease who have abnormalities in the Neurofibromatosis type I tend to develop neurofibrosarcoma.

Soft tissue sarcoma can occur in patients with hereditary retinoblastoma as a second primary malignancy.

6. Chromosome rearrangements

A number soft tissue tumors both benign and malignant have been found to have consistent chromosomal abnormalities which in many cases may be diagnostic.

Chromosomal translocations are the most common cytogenetic abnormality in soft tissue tumors.

Classification

HISTOLOGIC CLASSIFICATION OF STS

FIBROUS TUMORS

Fibro sarcoma

a. Adult fibro sarcoma

b. Congenital or infantile fibro sarcoma

c. Inflammatory fibro sarcoma (inflammatory myofibroblastic tumor)

FIBROHISTIOCYTIC TUMORS

1. Intermediate tumors

   Dermatofibrosarcoma protuberans

2. Malignant fibrous histiocytoma.

   a. Storiform- pleomorphic fibrous histiocytoma

   b. Myxoid fibrous histiocytoma

   c. Giant cell fibrous histiocytoma (malignant giant cell tumor of soft parts)

   d. Xanthomatous (inflammatory type) fibrous histiocytoma.

LIPOMATOUS TUMORS

Liposarcoma

a. Well- differentiated liposarcoma

   i.) Lipoma-like liposarcoma

   ii.) Sclerosing liposarcoma

   iii.) Inflammatory liposarcoma

b. Myxoid liposarcoma

c. Round cell (poorly differentiated myxoid) liposarcoma

d. Pleomorphic liposarcoma

e. De- differentiated liposarcoma

SMOOTH MUSCLE TUMORS

1. Rhabdomyosarcoma

    a. Embryonal rhabdomyosarcoma

    b. Botryoid rhabdomyosarcoma

    c. Spindle cell rhabdomyosarcoma

    d. Alveolar rhabdomyosarcoma

    e. Pleomorphic rhabdomyosarcoma

2. Rhabdomyosarcoma with ganglionic differentiation (ectomesenchymoma)

TUMORS OF BLOOD AND LYMPH VESSEL

1. Angiosarcoma and Lymphangiosarcoma

2. Kaposi's sarcoma

3. Follicular dendritic cell sarcoma

PERIVASCULAR TUMORS

1. Malignant glomus tumor
2. Malignant hemangiopericytoma

SYNOVAL TUMORS

1. Synovial sarcoma
    a. Biphasic (Fibrous and Epithelial) synovial sarcoma
    b. Monophasic (Fibrous or Epithelial) synovial sarcoma
2. Malignant giant cell tumor of tendon sheath

MESOTHELIAL TUMORS

1. Malignant solitary fibrous tumor pleura and peritoneum
2. Diffuse mesothelioma
    a. Epithelial
    b. Fibrous
    c. Diffuse

NEURAL TOMORS

1. MPNST (malignant schwannoma, neurofibrosarcoma)
    a. Malignant Triton tumor (MPNST with Rhabdomyosarcoma)
    b. Glandular MPNST (malignant glandular schwannoma)
    c. Epithelioid MPNST (malignant epithelioid schwannoma)

2. Malignant granular cell tumor
3. Clear cell sarcoma (malignant melanoma of a soft parts)
4. Malignant melanocytic schwannoma
5. Gastrointestinal autonomous nerve tumor (plexosarcoma)

6. Primitive neuroectodermal tumor
    a. Neuroblastoma
    b. Ganglioneuroblastoma
    c. Neuroepithelioma (peripheral neuroectodermal tumor)
    d. Extraskeletal Ewing's sarcoma

PARAGANGLIONIC TUMORS

1. Malignant paraganglioma

EXTRASKELETAL CARTILAGINOUS AND OSSEOUS TUMORS

1. Extraskeletal chondrosarcoma
    a. Well- differentiated
    b. Myxiod
    c. Mesenchymal

PLURIPOTENTIAL MESENCHYMAL TUMORS

1. Malignant mesenchymoma

MISCELLANEOUS TUMORS

1. Alveolar soft part sarcoma
2. Epithelioid sarcoma
3. Malignant extrarenal rhabdoid tumor
4. Desmoplastic small cell tumor

PATHOLOGY

The term sarcoma is Greek for “Fish flesh”, referring tumor’s tendency to feel fleshy when palpated. Mesodermal cells give rise to the connective tissues distributed throughout the body including pericardium, pleura, blood vessel, endothelium, smooth and striated muscle, bone, cartilage and synovium are the cells from which all sarcomas originate. Consequently, sarcomas develop in a wide variety of anatomic sites.

Approximately one half of all STS occurs in the extremities (lower- 38%, upper- 15%), where, the most common histopathologies are liposarcoma 30% and malignant fibrous histiocytoma 22%.

Retroperitoneal intra abdominal tumors comprise 14% of all STS with liposarcoma, the predominant histropathologic sub type (41%).

Visceral STS account for 13% and head and neck for 5%. Several histologic types of sarcoma have been characterized. This characterization can be difficult and is aided by electron microscopy.

Immuno histochemical staining for proteins such as vimentin, S-100, desmin, factor VIII, Keratin, Myoglobin and Actin often facilitates reliable histo typing.

One of the pathologic hallmark of STS distinguishing it from carcinoma is the tendency of STS to spread by hematogenous means.

Metastases are uncommon in patients with low grade STS in contrast to patients. Lymphnode metastasis from STS is rare occurring in less then 3% of adult patients. The histologic sub types with highest incidence of lymph node metastasis are:

- Epithelioid sarcoma 16.7%
- Embryonal Rhabdomyosarcoma 13.6%
- Angiosarcoma 13.5%
- Malignant fibrous histiocytoma 5%
- Synovial sarcoma

Clinical Presentation

- Most patients present with painless mass, although the pain is noted in 1/3rd of the patients.
- Non-specific abdominal discomfort and GI symptoms in intra abdominal or retroperitoneal STS.
- Delay in diagnosis is common with the most common differential diagnosis for extremity and trunk lesions being hematoma or “pulled muscle”.

Diagnosis

Physical examination

- Assessment of the size and mobility of the mass, relationship to fascia (superficial Vs deep) and near by neuro vascular and bony structures.
- A site- specific neuro vascular examination and assessment of regional lymph nodes.

Investigations

1. Biospsy – The primary thrust of biopsy is to obtain adequate tissue for definitive histopathologic confirmation, to evaluate grade, and to identify prognostic factors that would alter the approach to definitive treatment.

- **Indications**

    i. Any soft tissue mass in an adult that is symptomatic or enlarging is greater then 5cm in size.

    ii. Any new soft tissue mass that persists beyond 4-6 weeks

- **Technique**

Small superficial mass (<5cm)- excisional biopsy with clear margins in the preferred approach.

Large mass- incisional biopsy with a longitudeinal incision (extremity lesions) to facilitate subsequent wide local excision. Incision should be centered over the mass at its most superficial location. Care should be taken to raise flaps. Meticulous hemostasis should be ensured to prevent dissemination of tumor cells into adjacent tissue planes.

At definitive resection of a previously biopsied sarcoma the previous

scar should be excised enbloc with the tumor. Biopsy specimens should be sent fresh, sterile and anatomically oriented for pathologic analysis.

Fine needle aspiration cytology

FNAC has been examined by a number of authors but is usually confined to the confirmation of recurrence, rather than for the primary diagnosis.

2. **CT Scan**

Provides information on the size of the lesion and its relationship to adjacent structures and organs

3. **MRI**

- Examination of choice for imaging of soft tissue masses
- Enhances the contrasts between tumor and muscle, and tumor and adjacent blood vessel.
- Provides superior 3 dimensional definition of fascial planes (These substantial advantages allow for improvement assessment of resectability with pre operative MRI evaluation).

4. **Newer investigatory techniques**

Phosphorus magnetic resonance spectroscopy (^{31}P-MRS)

- It is a form of noninvasive resonance spectroscopy that detects phosphorus containing metabolites
- Employed to evaluate sarcoma inorganic – to – organic phosphate ratios.
- In – vivo metabolic assessment of response to anti- neoplastic therapy

5. Positron emission tomography (PET scan)

- By evaluating tumor metabolic activity PET scan may permit noninvasive assessment of tumor grade.

6. Radionuclide Scintigraphy

- Thalium – 201 and Gallium – 67 in osseous sarcoma
- Gallium – 67 in STS and in the assessment of patients with metastatic and recurrent STS.

7. Radiolmmunoscanning

^{125}I radiolabelled anti – sarcoma localizes foci of metastatic disease.

Staging

The American joint committee for cancer staging (AJCC) system for staging

STS believes on histologic grade, tumor size, nodal status and presence or absence of distant metastasis.

Histologic grading of sarcomas is found to be the critical determined of outcome. Histological grading is based on the following histopathologic criteria:

i. Cellularity

ii. Cellular pleomorphism

iii. Mitotic activity

iv. Necrosis

The AJCC staging system for STS

Histologic grade of malignancy (G)

Sx	Grade cannot be assessed
S1	Well differentiated
S2	Moderately differentiated
S3	Poorly differentiated
S4	Undifferentiated

Primary Tumor (T)

Tx	primary tumor cannot be assessed
T0	No evidence for primary tumor
T1	Tumor 5cmor smaller in greatest dimension
T2	Tumor larger than 5cm greatest dimension

Regional lymph node status (N)

Nx	Regional lymph nodes cannot be assessed
N0	No regional lymph node metastases
N1	Regional lymph node metastases

Distant metastases (M)

Mx	presence of distant metastases cannot be assessed
M0	No distance metastases
M1	Distant metastases

Staging /Grouping/Grading

IA	G1	T1	N0	M0
IB	G1	T2	N0	M0
IIA	G2	T1	N0	M0
IIB	G2	T2	N0	M0
IIIA	G3, G4	T2	N0	M0
IIIB	G3, G4	T2	N0	M0
IVA	Any G	Any T	N1	M0
IVB	Any G	Any T	Any N	M1

Binary grading system for STS employed at memorial sloan – kettering cancer Center (MS-KCC)

Low grade STS	High grade STS
Good Differentiation	Poor differentiation
Hypo cellar	Hyper cellular
Increased stroma	Minimal stroma
Hypo vascular	Hyper vascular
Minimal necrosis	Significant necrosis
<5 mitoses/ 10 HPF	>5 mitoses / 10 HPF

MS-KCC sarcoma prognostic factors

	Favorable Factors	Adverse Factors
Size	<5cm	>5cm
Site	Superficial	Deep
Histologic	Low	High

Prognostic factors

A through knowledge of the clinico pathologic factors known to have an impact on outcomes is essential in formulating a treatment plan for patents with STS.

Summary of significant prognostic factors for extremity STS

Outcome variable	Factors found to be prognostic by multi- variate analysis
Local recurrence (only)	Presentation with recurrent disease inadequate surgical margin (gross or microscopically positive)
Development of distant	High histologic grade
Metastasis	Deep location size > 5cm
Post metastasis survival	Age at metastasis > 60 yrs time from presentation to metastasis to site(s) other then single lung
Disease related mortality	High histologic grade deep location size > 5cm

TREATMENT

Surgery – Primary therapy and results

For patients wit localized disease, surgical treatment is the corner stone of treatment. The surgical approach to sarcomas is predicted on one pathologic fact and its clinical correlate.

STS tend to expand and infiltrate tissue planes, producing a pseudo capsule composed of normal host tissue inter laced with fimbriae of tumor.

For patients with alimb sparing option a multimodality approach employing limb-sparing surgery combined with adjuvant chemo or radiotherapy yields local control and disease related survival rates comparable to amputation, while preserving a functional extremity.

Currently at least 85% of patients with localized extremity sarcomas can undergo limb sparing procedures.

Surgical Approach:

A tissue diagnosis is made. Pre-operative imaging studies (CT scan/MRI) have enabled accurate prediction resectability.

Planned resection should emcompass the skin, subcutaneous tissue and soft tissues adjacent to the tumor, including the previous biopsy site and any associated drain sites or wound complications.

There are no data to support compartmental or large muscle group resections over wide local excision with negative margins.

Tumor should be excised with a 2-3 cm margin of normal surrounding tissue since there are good adjuvant approaches to facilitate local control this ideal target margin is frequently compromised as opposed to attempting major vascular or bony section.

Adjuvant radiation therapy is indicated metal clips should be placed at the margins resection to facilitate radiation field planning.

Drain sites should be positioned close to the wound to simplify treatment of a possible nature local recurrence.

There is no role for routine regional lymph node dissection. Therapeutic lymph node dissection (curative) results in a 34% actual survival patients with regional lymph node involvement who has no evidence of extra nodal disease should therefore therapeutic lymphadenectomy.

Radiation Therapy – Neo-adjuvant and Adjuvant

Radiation therapy alone has been employed as primary treatment for STS for patients with locally advanced disease or for patients who present with stage IV metastatic disease.

Efforts to use RT as primary treatment have demonstrated that

1. High doses (>6500cGy) are required to achieve local control rates of 30% - 60%
2. Local control rate is inversely proportional to tumor size.

In general, local control rates with RT alone are inferior to those following surgery.

Primary RT should therefore be reserved for patients.

i) Who are medically unfit

ii) Who have technically unresectable tumors

iii) Who refuse surgery as initial treatment

Pre-operative RT has several theoretic advantages:

1. The unmanipulated tunor allows for a smaller treatment field than postoperative radiation.

2. Sterilization of tumor cells leads to reduced risk of intra vascular and would seeding with tumor cells at surgery.

3. Reduction in tumor volume increases resectability rates (The adverse effects of preoperative radiation on wound healing balance these theoretic advantages)

Adjuvant external beam RT is designated to treat residual microscopic disease that extends beyond the primary tumor mass and the margin of resection.

Adjuvant RT has also been delivered using the brachy therapy technique.

- Involves either permanent placement of radioactive sources (gold- 98 or iodine-

131)

- Temporary placement of an interstitial implant with after loading catheters positioned in to the tumor bed at surgery (usually iridium- 192) on the 5^{th} or 7^{th} postoperative days to deliver 42 to 60 Gy over the following 4 to 6 days

Chemotherapy – Neoadjuvant and Adjuvant

Tumor response to preoperative chemotherapy provides significant prognostic information and identifies sub group of patients most likely to respond to adjuvant chemotherapy.

Agents used:

Doxorubicin based neo adjuvant CT (CYVADIC regime-cyclophosphamide, adriamycin, dacarbazine with or without vincristine)

The combination resulting in the highest response rate in STS is doxorubicin ($60mg/m^2$). For younger patients who can tolerate myelosuppression the dose of doxorubicin can be increased $75mg/m^2$ with hematopoietic growth factor support.

The dose of doxorubicin (60mg/m2) and infosfamide (7.5gm/m2) with or without DTIC 9900mg/m2). For younger patients who can tolerate myelosuppression the does of doxorubicin can be increased 75mg/m2 with hematopoietic growth factor support.

The does of doxorubicin and DTIC should be given by continuous infusion over 4 days to decrease the risk of cardio toxicity and the severity of nausea and vomiting. Ifosfamide should be divided and given daily over 3 days and given with mesna for bladder protection.

Physicians may choose single agent doxorubician or doxorubicin and DTIC for palliation in patients who may not tolerate combined doxorubicin and ifosfamide. Doxorubicin (Adriamycin) and ifosfamide are the most active single agents in the treatment of STS, with response rates of 15% to 35% in various studies.

A dose response relationship for doxorubicin has been observed in randomized trials dose rates 60 – 79 mgs/m2 every weeks are generally superior to does rates of 50 mg/m2, ifosfamide, an analogue of cyclophosphamide, also demonstrates a steep dose response curve.

Ifosfamide is currently the most active salvage agent for patients in whom doxorubicin-containing regimens have failed.

Treatment of locally recurrent and metastatic sarcoma

Local recurrence

- Recurrent disease will develop in at lease 1/3rd of patients with a median disease free interval of 18months.
- Local recurrence rates varies with the primary site.
- Highest for retroperitoneal and head and neck sarcomas.

This is in part to the fact that adequate surgical margins are technically more difficult to attain these locations.

In addition, employment of high dose adjuvant RT is often limited in these sites of nodules arising in the surgical scar or radiation port.

After a staging evaluation, patients with isolated local recurrence should undergo re-operation.

If no prior RT was employed, adjuvant RT should be used after surgery.

Recent investigatory Treatment:

Regional perfusion of cytotoxic agents.

Cisplatin hyperthermic limb perfusion in extremity sarcoma patients.

High-dose recombinant TNF-a in combination with interferon-y and mephalan.

Metastatic disease

Most common site for metastasis is the lung (indeed, the lung is the only site of recurrence in approximately 50% of all patients.) Primary GI sarcomas metastasize to liver via the portal system. All patients with suspected metastasis should be evaluated by chest CT – scanning.

Surgical treatment for metastatic disease

Appropriate patient selection for surgical approach for pulmonary metastasis is critical.

The criteria agreed upon are:

1. The primary tumor is controlled or is controllable.

2. There is no extra thoracic disease.

3. The patient is a medical candidate for thoracotomy.

4. Complete resection of all disease appears possible.

Prognostic Factors:

1. A shorter disease-free interval and incomplete pulmonary resection are adverse prognostic factors for survival for patients with pulmonary metastasis.

2. The presence of multiple metastatic pulmonary nodules (> 3) is an adverse prognostic factor.

3. Tumor doubling time (TDT)

The most important prognostic factor influencing survival is the ability to resect all disease completely.

Wedge excision with negative margins is the procedure of choice for patients with isolated pulmonary metastasis.

Lobectomy or pneumonectomy is considered in case of anatomic proximity of metastatic lesion to pulmonary artery, vein or major bronchus.

Multiple ipsilateral and bilateral lesions are not contraindications. Bilateral lesions can be approached by staged thoracotomies, median sternotomy, simultaneous, bilateral anterior thoracotomies. unilateral isolated lesions may be amenable to thoracoscopic resection.

Systemic therapy:

Patients with unresectable pulmonary metastasis or extra pulmonary metastasis are best treated with systemic chemotherapy.

Doxorubicin based regimens remain the standard therapy for advanced soft tissue sarcomas.

SPECIFIC ANATOMIC SITES

RETROPERITONEAL SARCOMAS

15% of all sarcomas

Most common histologic subtypes are:

- Liposarcoma 42% of cases
- Leiomyosarcoma 26% of cases

Fibrosarcoma 6% of cases

Presenting symptoms and signs:

Abdominal mass-80%

Pain at presentation – 50%

Non-specific gastrointestinal symptoms

Neurologic symptoms (primarily sensory) – 27%

Weight loss-7

Investigations:

CT scan and MRI

- Assessment of te consistency of the mass (cystic or solid components, associated necrosis)
- Pinpoint the precise anatomic location and exent of any regional disease. Confirms the function of contralateral kidney.

Differential Diagnosis

Testicular neoplasm

Physical examination of testis, B-HCG and AFP, testicular ultrasound helps in differentiating.

Biopsy

In general, pre-operative needle biopsy should not be performed for most retroperitoneal tumors. For clearly unresectable lesions, or incases in which physical examination or laboratory studies suggest lymphoma or germ cell tumor, a needle biopsy may facilitate the diagnosis.

Open biopsy or complete resection at exploratory laparotomy is the preferred means of establishing the diagnosis.

Treatment of retroperitoneal STS

Surgical resection with margins is the standard primary treatment. [With the possibility of en bloc multi organ resection to achieve negative margins (kidney, colon, or pancreas), all patients should have pre-operative bowel preparation and assessment of bilateral renal function by CT scan]

Most common reasons for unresectability:

- Major vascular involvement (aorta, IVC), peritoneal implants, or distant metastasis.

Partial resections/Debulking have been performed, but there is no evidence that partial resection improves survival.

Gastrointestinal sarcomas

Gastrointestinal sarcomas are uncommon, accounting for 4% of all sarcomas. The most common histologic subtype is leiomyosarcoma. With the exception of the oesophagus, which accounts for 5% of all GI sarcomas, the frequency of GI sarcomas declines as one moves distally along the gastrointestinal tract, with stomach, small bowel, and colorectal sarcomas accounting for 50, 30 and 15% of GI sarcomas, respectively.

Presenting symptoms and signs of GI sarcomas are similar to those of carcinomas arising in the same segment of the gastrointestinal tract.

Diagnosis of GI sarcomas is often established pre operatively and is frequently made when the patient undergoes laparotomy for a mass in the small bowel or colon.

Treatment for GI sarcomas

The choice of appropriate surgical procedure for GI sarcomas is based on tumor size, anatomic site, and the fact that these sarcomas rarely spread to involve regional lymph nodes.

- For localized gastric lesions, wedge resection with negative margins is the procedure of choice.

- More extensive gastric lesions may require total gastrectomy or en bloc resection of adjacent organs.

- Duodenal sarcomas like other duodenal malignancies may require pancreaticoduodenostomy to achieve negative resection margins.

- Small bowel and colon lesions should be treated wit segmental resection.

- Extensive lymph node dissection or removal of grossly uninvolved mesentery is not required.

- Results from recent limited series have shown no benefit to adjuvant chemotherapy or radiotherapy for patients with gastrointestinal sarcomas.

  Complete resection of isolated peritoneal or hepatic metastasis improves survival and should be attempted if feasible in good-risk patients.

Head and neck sarcomas

Head and neck sarcomas are uncommon, accounting for only 4% of all sarcomas

and less than 1% of head and neck malignancies in adults.

The most common histologic subtypes in adults are:

1. Fibrosarcoma 18%
2. Malignant fibrous histiocytoma 16%
3. Rhabdomyosarcoma 15%

Methods of diagnosis, imaging and biopsy for head and neck sarcomas do not differ substantially form those for other head and neck tumors.

Treatment for Head and Neck Sarcomas

Wide surgical excision with negative margins is the therapeutic mainstay for head and neck sarcomas.

Regional lymph node metastases are rare. In the absence of clinically positive lymph nodes routine lumpadenectomy is not required.

Adjuvant radiotherapy should be considered whenever there is doubt as to the adequacy of surgical margins or the location of the tumor precludes complete excision.

As with sarcomas elsewhere, there is no clearly defined role for adjuvant chemotherapy.

MATERIALS AND METHODS

MATERIALS AND METHODS

This was a conducted for a period of 2 years. In this study, 40 patients from various units were analyzed. All the newly diagnosed patients and patients diagnosed outside and referred to Coimbatore Medical College Hospital for further evaluation and management were included in the study.

A detailed history was taken for all the patients. All the patients were subjected to a through clinical examination with regards to the presenting problem as well as associated co-morbid conditions. Biopsy (incision or excision) was done for all the patients. FNAC was done patients presented with swelling in the neck region. CT scan was taken for 26 patients. One patient came with MRI done outside. Plain X-Ray local area and CXR was taken for all the patients.

Other routine investigations were done for all the patients for anesthetic purpose. Sr. Creatinine and Sr. Bilirubin was done for all the patients for assessing the fitness for adjuvant chemotherapy and/or radiotherapy.

Anasthetic assessment for fitness for surgery was done for 26 patients, who were then taken up for surgery. 14 Patients were not considered for surgery because of the advanced nature of their diseases and poor general condition and were offered palliative chemotherapy/ radiotherapy/supportive care.

OBSERVATION

Observation

The incidence of soft tissue sarcoma in our study was as follows:

No. of Cancer Cases	Soft Tissue Sarcomas	Percentage
3463	40	1.15 %

The sex distribution of STS in our study was as follows:

No. of cases of STS	Male	Female	M:F Ratio
40	31	9	3:5:1

Age specific incidence:

S.No	No. of patients	Male	Female
0-10 yrs	1	1	Nil
11-20 yrs	1	1	Nil
21-30 yrs	4	2	2
31-40 yrs	10	7	3
41-50 yrs	10	9	1
51-60 yrs	10	7	3
61 and above	4	4	Nil

Maximum number of cases occurred between 31 and 60 years (30 cases), in our study and the youngest and the oldest patients were 3 years, and 75 years old, respectively.

The various clinical patients presentations of STS patients in our study were as follows:

S.No	Clinical presentation	No. of cases	Percentage
1.	Swelling	32	89 %
2.	Pain	9	25 %
3.	Regional L.N enlargement	3	8 %
4.	Mass abdomen	2	5.5 %
5.	Bony erosion	2	5.5 %
6.	Wrist drop	1	3.6 %
7.	Bleeding PV	1	3.6 %

6 patients presented with metastatic disease.

1 patient had a history of trauma 1 year ago.

4 patients had chronic illnesses like CAHD and diabetes mellitus.

25 patients were chronic smokers and alcohol intakers.

8 patients were betel nut/tobacco chewers.

The site distribution of soft tissue sarcomas in our study was as follows:

Upper extremity	Lower extremity	Trunk	Retroperitoneal/ Intra abdominal	Viscera
Elbow – 6 Arm – 2	Thigh – 11 Knee – 2 Ankle– 1 Foot – 1	Shoulder – 5 Chest wall – 2 Abd. Wall – 1 Neck – 3 Back – 3	Retroperitoneal – 1 Intra abdominal – 1	Uterus – 1

The various histological types in our study were as follows:

S. No	Histologic type	No. of cases	Percentage
1	Liposarcoma	12	30 %
2	Malignant fibrous Histio Cytoma	10	25 %
3	Fibrosarcoma	10	25 %
4	Synovial Sarcoma	3	7.5 %
5	Rhabdomyo Sarcoma	3	7.5 %
6	Haemangio Pericytoma	1	2.5 %
7	Schwannoma	1	2.5 %

Histological Grading in our study:

S.No	Histological Grade	No. of cases	Percentage
1.	High	12	30 %
2.	Intermediate	10	25 %
3.	Low	18	45 %

Surgical treatment given to our patients was as follows:

Surgery	No of cases
Wide excision	18
Amputation	5
De – bulking	2
Partial excision	1

Treatment modalities adopted in our patients were as follows:

Treatment modality	No. of cases
Surgery alone	2
Surgery + Adjuvant RT	16
Surgery + Adjuvant RT + Adjuvant CT	6
Surgery + Adjuvant CT	6
Palliative RT/CT/Supportive Care	10

Histological types to recur were as follows

S. No	Histological type	No. of cases
1.	Malignant fibrous histiocytoma	4
2.	Fibrosarcoma	3
3.	Synovial sarcoma	2
4.	Liposarcoma	8

5.	Rhabdomyosarcoma	1
6.	Schwannoma	1

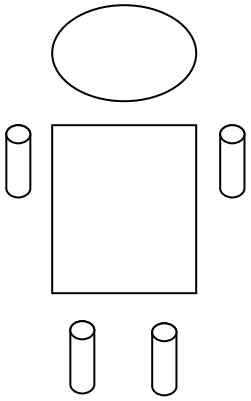
Sites of recurrence were as follows:

S.No	Site of recurrence	No. of cases
1	Lower extremity	7
2	Upper extremity	3
3	Trunk	4
4	Others	2

Distribution by site of STS in 40 patients admitted in CMCH between May 2007 and October 2009

Upper extremity 20 %

Trunk 35 %



Retroperitoneal / Intra – abdominal 5 %

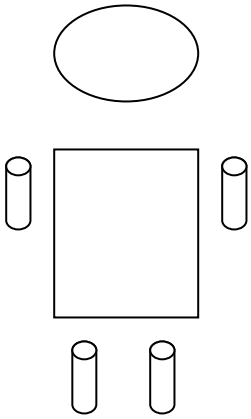
Visceral 3 %

Lower extremity 37 %

Distribution by site of STS in 3968 patients aged 16 or older admitted to Memorial Sloan – Kettering Cancer Center between July 1982 and July 1999

Upper extremity 14 %

Trunk 11 %

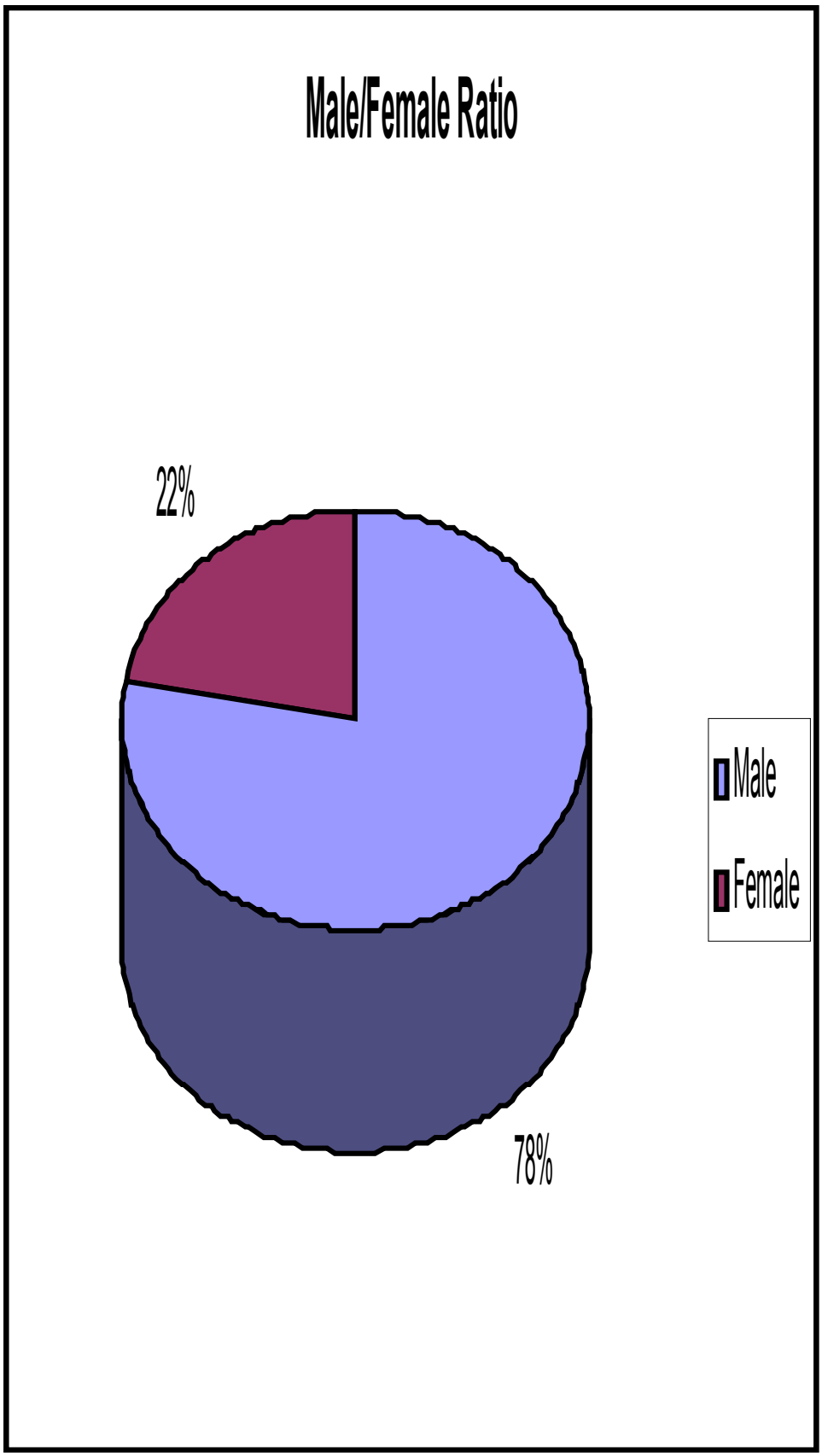


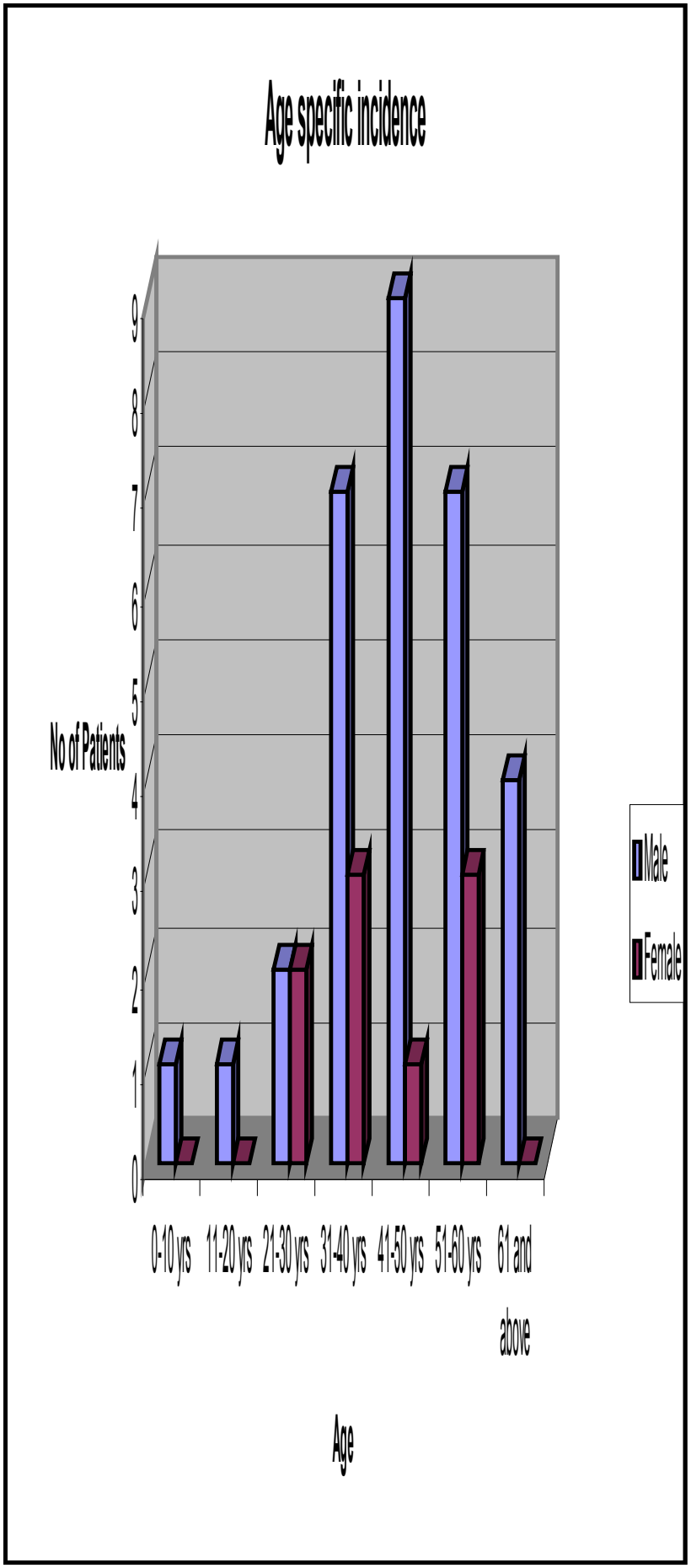
Retroperitoneal / Intra – abdominal 15 %

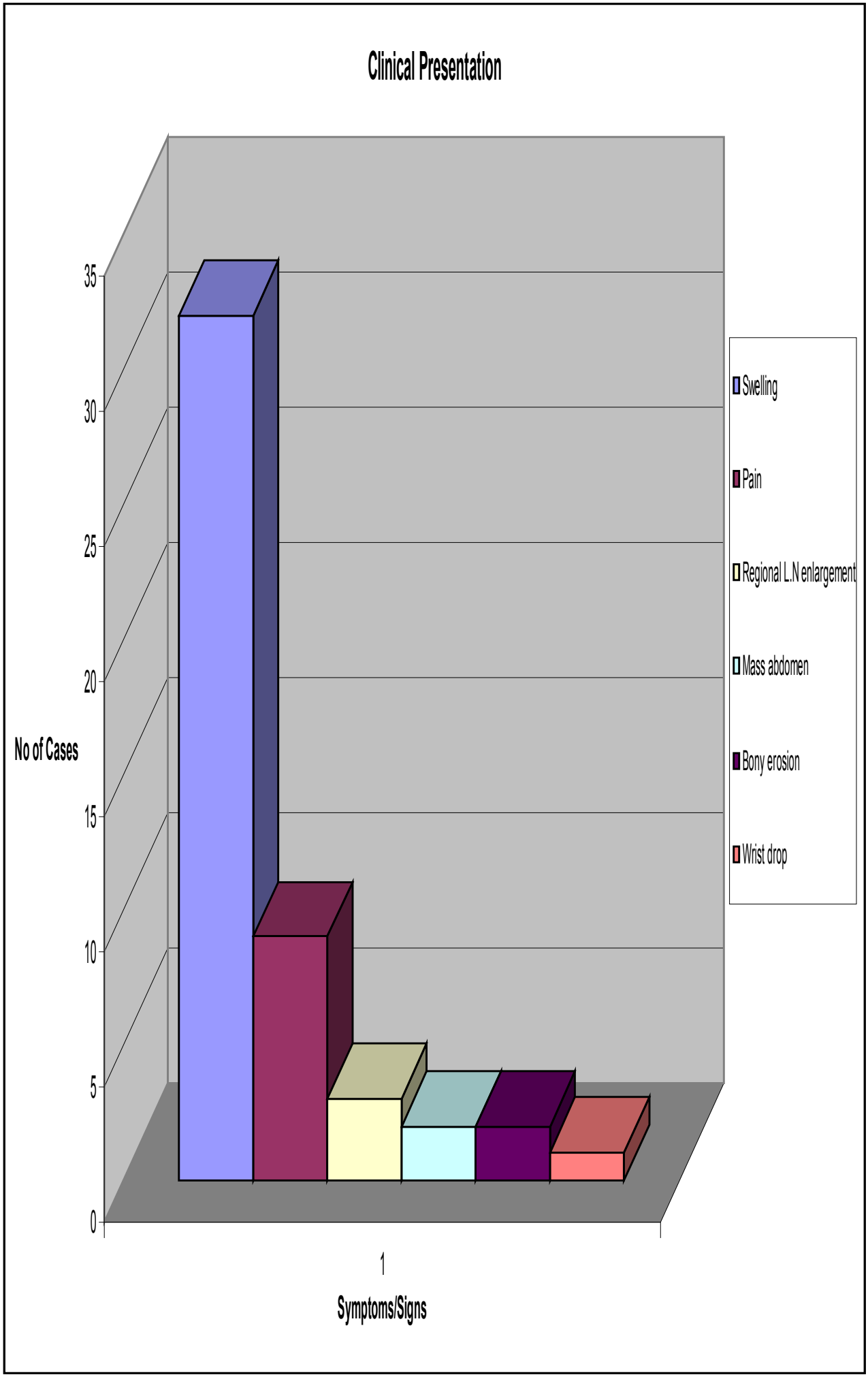
Visceral 16 %

Lower extremity 32 %

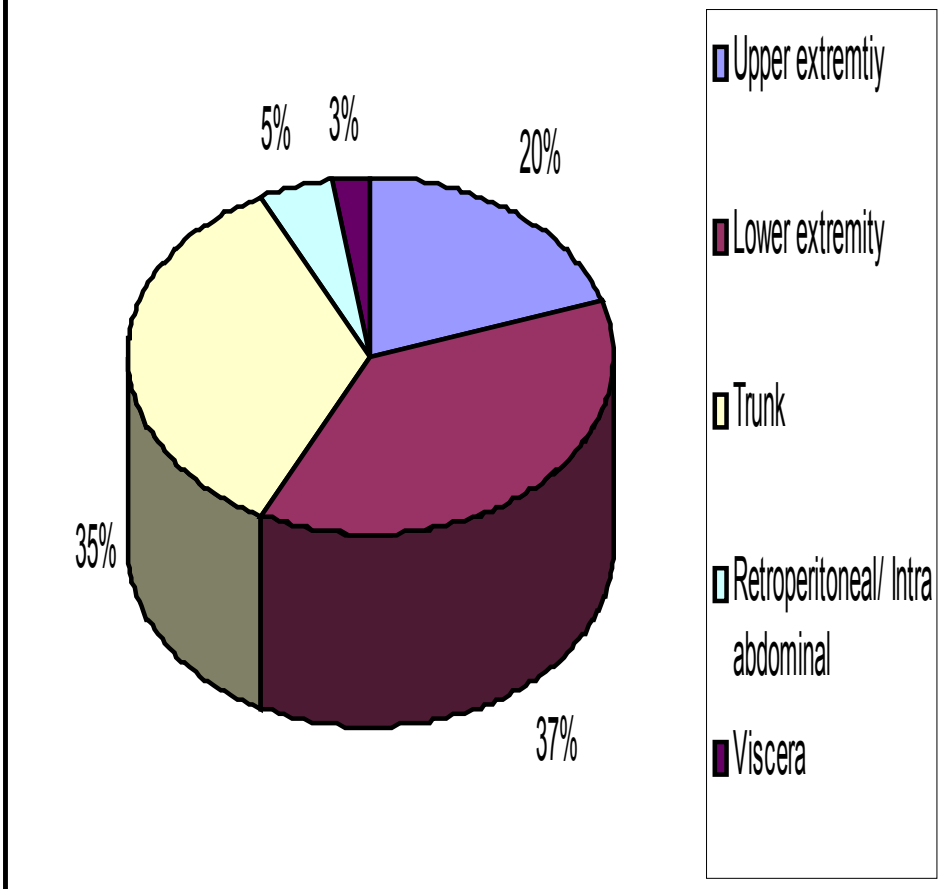
Others 12 %


Male/Female Ratio
22%
78%
Male
Female

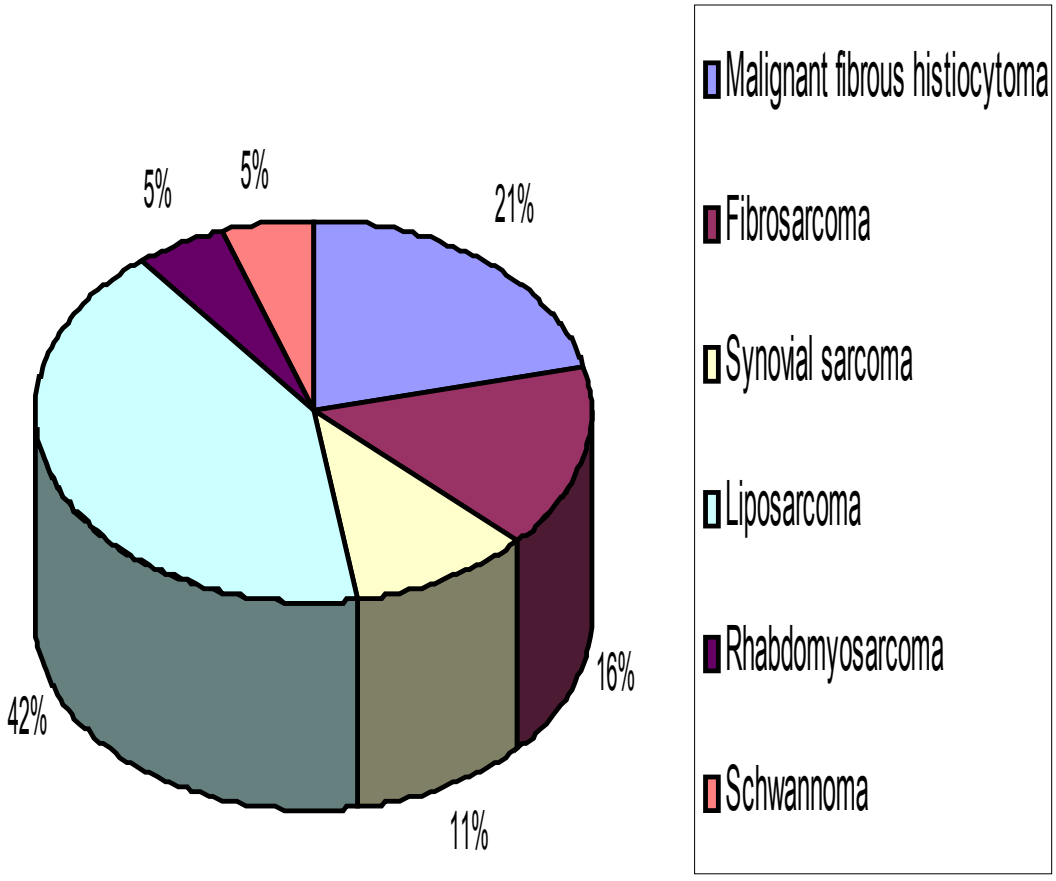

Age specific incidence
No of Patients
0
1
2
3
4
5
6
7
8
9
0-10 yrs
11-20 yrs
21-30 yrs
31-40 yrs
41-50 yrs
51-60 yrs
61 and above
Age
Male
Female

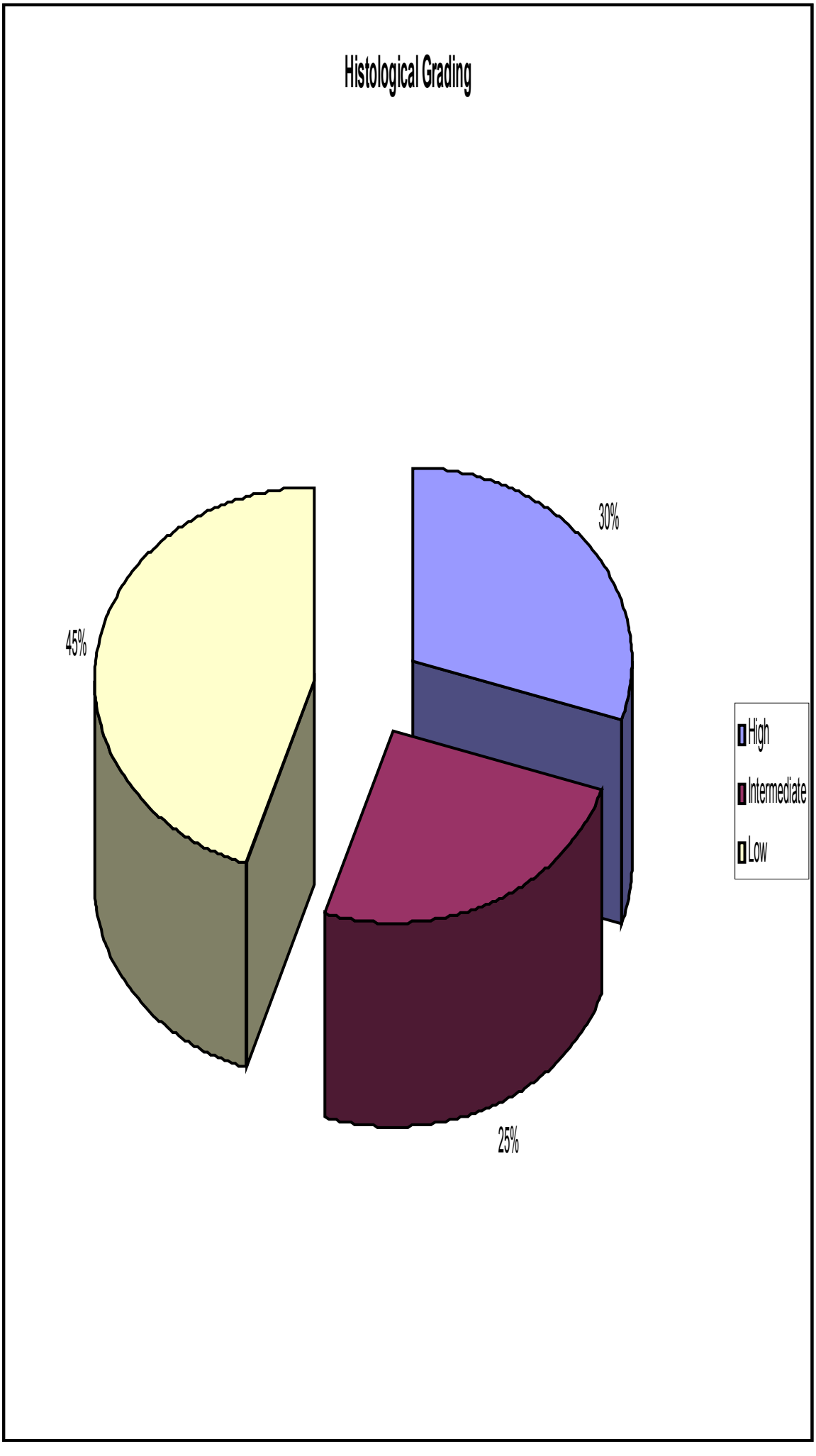

Clinical Presentation
No of Cases
35
30
25
20
15
10
5
0
1
Symptoms/Signs
Swelling
Pain
Regional L.N enlargement
Mass abdomen
Bony erosion
Wrist drop

Sites of Occurence



Histological Types to recur




Histological Grading
30%
45%
25%
High
Intermediate
Low

DISCUSSION

DISCUSSION

Out of the 3463 cancer cases admitted in Coimbatore Medical College Hospital during the period of this study, only 40 cases were soft tissue sarcomas, the incidence of which was 1.15 %, which was similar to that found in largest centers for soft tissue sarcomas like Memorial Sloan – Kettering Cancer Center.

Incidence in Male was higher than in Female. (3.5:1)

Soft tissue sarcoma was more common between the age group of 30 and 60 years, (75 %) in our study.

Unlike that observed by Memorial Sloan – Kettering Cancer Center, pediatric cases were very less in number in our study.

The most common clinical presentation in our study was swelling (89 %). Other symptoms and signs were pain, lump abdomen, regional lymphadenopathy, bony erosion, wrist drop, bleeding PV.

The minimum duration of symptoms was 3 months; maximum was 36 months.

The minimum size of the swelling in our study was 3 cm, and the maximum was 30 cm in greatest diameter.

The largest tumors 1) 30 cm x 25 cm 2) 25 cm x 20 cm found in our study were of

retroperitoneal in origin. Out of these 36 cases, 20 cases were >5cm in size. This could be the evidence that the patients had presented themselves very late for clinical assessment.

6 patients presented with metastatic lung secondaries, who were eventually turned out to be candidates for palliative therapy/supportive care.

4 patients had other medical illnesses like CAHD, DM

1 patient had a history of trauma one year ago. Most of the patients were chronic smokers and alcoholics. Few were betel leaf/nut/tobacco chewers. Almost all the patients were taking mixed diet.

Site distribution

The most common site of occurrence in our study was the thigh. In general, maximum number of cases occurred in the lower extremity (37 %), followed by trunk (35 %), upper extremity (20 %), neck (8 %), retroperitoneum/intra – abdominal (5 %) and viscera (3 %).

Histological Types:

The most common histological type in our study was liposarcoma (30 %) as in Memorial Sloan – Kettering Cancer Center.

The choice of appropriate treatment was based on tumor size, anatomic site and patient preference. Surgery in the form of wide excision, amputation for extremity lesions, debulking and partial excision was done in 26 cases.

1. Surgery alone was done, without adjuvant RT/CT, in 2 patients.
2. Surgery + Adjuvant radiotherapy (5000cGy to 6000cGy), was given in 16 patients.
3. Surgery + Adjuvant radiotherapy + Adjuvant chemotherapy (CTX, ADR, VCR-6 cycles) for 6 patients
4. Surgery + Adjuvant chemotherapy alone, without radiotherapy for 6 patients, where the various treatment modalities adopted

All the patients were followed-up at monthly intervals during the course of the treatment with Hb %, TC, DC, Platelet count, Sr. Creatinine, Sr. Billirubin, while they were on adjuvant RT/CT.

After the end of treatment, patients were followed-up at 2 monthly intervals.

Mean duration of follow-up was 1 year. Maximum period of follow-up in our study was 21 months.

More than half of the patients did well with the above management.

Recurrence occurred in nearly 50 % of the patients in our study, whereas it is nearly 1/3 of cases in Memorial Sloan – Kettering Cancer Center. The reason for this high recurrence rate in our study may be due to late presentation.

The most common histological type to recur, in our study, was Liposarcoma (42 %), followed by malignant fibrous histiocytoma (21 %).

Most common site of recurrence was the thigh followed by trunk.

Minimum duration for recurrence, in our study was 2 months.

Management of recurrent disease:

All the cases of recurrence, in our study were in sites amenable for wide excision/ radical surgery.

All the patients with recurrence were thoroughly investigated for metastatic disease.

1. 6 patients with recurrence in the extremities, were treated with amputation followed by radiotherapy
2. 8 patients were treated with wide excision, followed by radiotherapy
3. 2 patients were treated with palliative chemotherapy.

Regular follow-up was done for these patients as done earlier. Minimum duration of follow-up for recurrent cases in our study was 6 months, and the maximum was 18 months.

One case recurred in 4 months and another in 10 months. A patient with retroperitoneal liposarcoma recurred in 6 months, with metastatic lung secondaries, for whom, only palliative chemotherapy and supportive care could be offered.

CONCLUSION

CONCLUSION

1. The incidence of soft tissue sarcoma in Coimbatore Medical College Hospital was 1.15%

2. There was no specific etiological factor in the patients studied.

between 31- 60 years

n lesions corresponds to that found in the literature.

extremities, especially lower extremity.

s liposarcoma (12 cases) in our study.

hat given in the Literature.

8. Uncommon lesions like Haemangiopericytoma (1 case) and Malignant Schwannoma (1case) were noted

9. Biopsy, either incision or excision is mandatory for diagnosing as well as grading Soft Tissue Sarcomas.

f recurrence.

11. Wide excision with clear margins followed by adjuvant radiotherapy is the preferred treatment of choice

12. Causes for recurrence could be higher grade of the tumors, late presentation (with metastasis) and inadequate surgical clearance.

13. Monthly follow up for atleast 3 years after the end of therapy is essential for the early identification of recurrence and/or dissemination.

14. Recurrent lesions were managed in the same manner as primary lesions. Results were as good nearly as non-recurrent lesions

SUMMARY

To summarize, in any patient presenting with a soft tissue mass which is symptomatic or asymptomatic, is enlarging, or persisting beyond 4 to 6 weeks an early histological diagnosis, either by incision/excision biopsy should be made.

In case of Soft Tissue Sarcoma, an early surgical intervention with adequate clearance, followed by adjuvant radiotherapy should be the practice, to be adopted to achieve better results in our setup and periodical follow-up for the early detection of recurrence.

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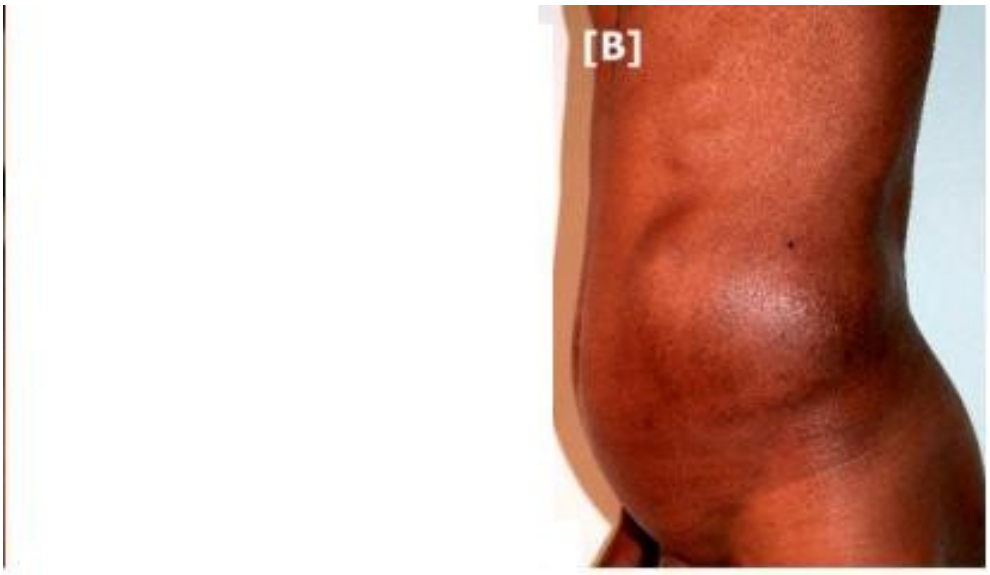
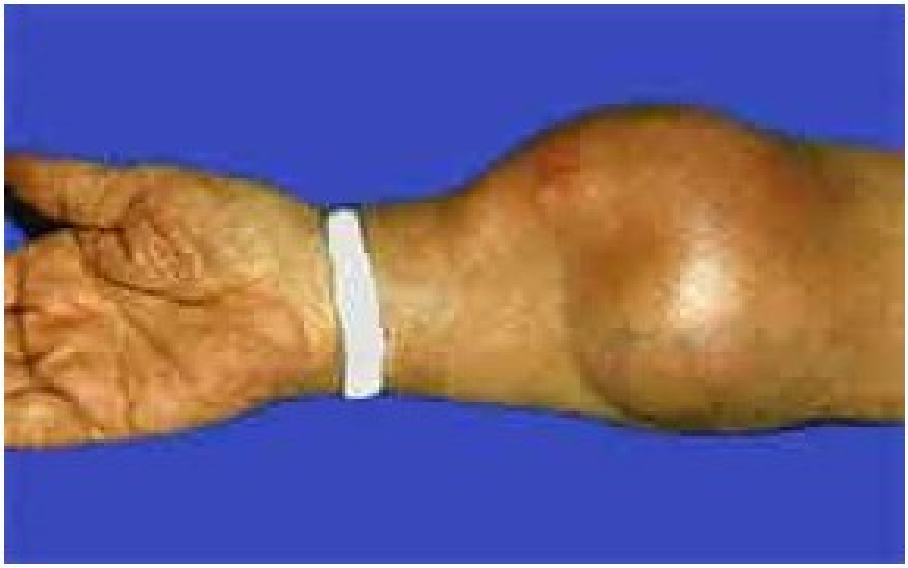
PHOTOS



50 Year Old Male with Retroperitoneal Sarcoma

45 year old Male with Malignant fibrous histiocytoma



35 year old Male with Malignant fibrous histiocytoma

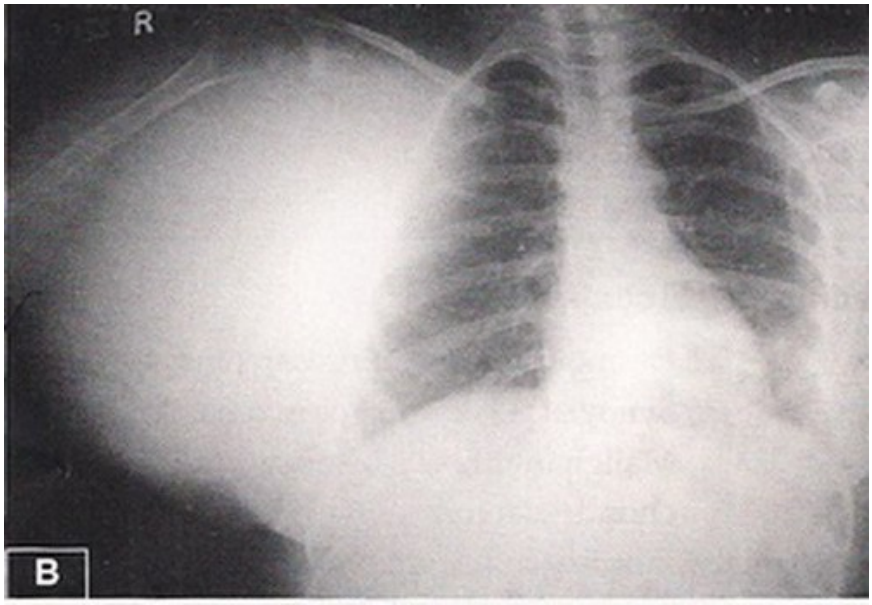
Bleeding soft tissue sarcoma

55 year old Male with Malignant fibrous histiocytoma

35 years Female with Liposarcoma

42 Years Male with Liposarcoma

SOFT TISSUE SARCOMA OF UPPER EXTREMITY



SOFT TISSUE SARCOMA OF UPPER EXTREMITY